

# EC140-15 Mathematical Techniques B

**23/24**

**Department**

Economics

**Level**

Undergraduate Level 1

**Module leader**

Alexander Dobson

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

Multiple

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

Students will be given the opportunity to develop the requisite quantitative skills for a rigorous study of contemporary economics, including univariate and multivariate calculus, constrained optimization and matrix algebra. The module incorporates both the essential mathematical methods as well as illustrative economic applications. You will also develop appropriate maths-related technical computing skills.

[Module web page](#)

### Module aims

To develop the requisite mathematical and quantitative skills for a rigorous study of contemporary economics, including econometric methods and applied economics. The module forms part of the first year core cluster EC120 Quantitative Techniques, which is made up of one module in Mathematical Techniques (A (EC121) or B (EC123)), and one module in Statistical Techniques (A (EC122) or B (EC124)).

### Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Pre-requisite. You will be expected to have a good knowledge of A level algebra and calculus including the rules of differentiation and integration (which will not be taught).

The module will typically cover the following topics:

Calculus of functions of two or more variables; Unconstrained and constrained optimisation; Comparative statics; Matrix algebra; Financial mathematics, and an introduction to difference equations; Illustrative applications of all techniques in economics; mathematical computing skills.

## **Learning outcomes**

By the end of the module, students should be able to:

- ...acquire the tools of quantitative methods necessary to study core and optional first and second year modules in economics for the single honours Economics degree;
- ...develop basic programming ability in the selected statistical software package, including utilising this software to graph functions and undertake mathematical methods;
- '... to enable a systematic quantitative approach to analysing economic problems;
- develop technical computing skills for writing mathematical text and numerical mathematical analysis

## **Indicative reading list**

Please see Talis Aspire link for most up to date list.

[View reading list on Talis Aspire](#)

## **Subject specific skills**

Students will have the opportunity to develop skills in:

Analytical thinking and communication

Analytical reasoning

Problem-solving

Abstraction

Analysis of optimisation

## **Transferable skills**

Students will have the opportunity to develop:

Numeracy and quantitative skills

IT skills

Written communication skills

Oral communication skills

Mathematical, statistical and data-based research skills

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## **Study**

## Study time

Type	Required
Lectures	10 sessions of 2 hours (13%)
Seminars	4 sessions of 1 hour (3%)
Demonstrations	4 sessions of 1 hour (3%)
Private study	122 hours (81%)
Total	150 hours

## Private study description

Private study will be required in order to prepare for seminars/classes, to review lecture notes, to prepare for forthcoming assessments, tests, and exams, and to undertake wider reading around the subject.

## Costs

No further costs have been identified for this module.

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## Assessment

You do not need to pass all assessment components to pass the module.

### Assessment group D

	Weighting	Study time
Test 1 50 minute online test	12%	
Test 2 50 minute online test	12%	
Problem set 6 x problem sets (1% each)	6%	
Online Examination	70%	

A paper which examines the course content and ensures learning outcomes are achieved.

~Platforms - AEP

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## Weighting

## Study time

- Online examination: No Answerbook required

## Assessment group R

### Weighting

### Study time

Online Examination

100%

A paper which examines the course content and ensures learning outcomes are achieved.

~Platforms - AEP

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- Online examination: No Answerbook required

## Feedback on assessment

The Department of Economics is committed to providing high quality and timely feedback to students on their assessed work, to enable them to review and continuously improve their work. We are dedicated to ensuring feedback is returned to students within 20 University working days of their assessment deadline. Feedback for assignments is returned either on a standardised assessment feedback cover sheet which gives information both by tick boxes and by free comments or via free text comments on tabula, together with the annotated assignment. For tests and problem sets, students receive solutions as an important form of feedback and their marked assignment, with a breakdown of marks and comments by question and sub-question. Students are informed how to access their feedback, either by collecting from the Undergraduate Office or via tabula. Module leaders often provide generic feedback for the cohort outlining what was done well, less well, and what was expected on the assignment and any other common themes. This feedback also includes a cumulative distribution function with summary statistics so students can review their performance in relation to the cohort. This feedback is in addition to the individual-specific feedback on assessment performance.

[Past exam papers for EC140](#)

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## Availability

### Pre-requisites

For Economics joint degree course students A-level in Mathematics, or equivalent.

### Post-requisite modules

If you pass this module, you can take:

- EC228-15 Political Economy: Theory and Applications

## Courses

This module is Core for:

- UECA-3 Undergraduate Economics 3 Year Variants
  - Year 1 of L100 Economics
  - Year 1 of L100 Economics
  - Year 1 of L100 Economics
  - Year 1 of L116 Economics and Industrial Organization
  - Year 1 of L116 Economics and Industrial Organization

This module is Core optional for:

- Year 1 of UIPA-L1L8 Undergraduate Economic Studies and Global Sustainable Development
- Year 1 of UPHA-L1CA Undergraduate Economics, Psychology and Philosophy
- UPHA-V7ML Undergraduate Philosophy, Politics and Economics
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)

This module is Core option list A for:

- UECA-LM1D Undergraduate Economics, Politics and International Studies
  - Year 1 of LM1D Economics, Politics and International Studies
  - Year 1 of LM1D Economics, Politics and International Studies
- UPHA-V7ML Undergraduate Philosophy, Politics and Economics
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)

This module is Core option list B for:

- Year 1 of ULNA-R1L4 Undergraduate French and Economics (4-year)
- Year 1 of ULNA-R3L4 Undergraduate Italian and Economics (4-year)

This module is Core option list C for:

- Year 1 of ULNA-R4L1 Undergraduate Hispanic Studies and Economics (4-year)

This module is Core option list D for:

- Year 1 of ULNA-R2L4 Undergraduate German and Economics (4-year)
- Year 1 of ULNA-R9L1 Undergraduate Modern Languages and Economics (4-year)